

Hernia

HERNIA

DEFINITION

- **Hernia** is a protrusion of a viscus or part of a viscus usually within a peritoneal sac through a defect in the abdominal wall
- **Clinically** ; painless swelling characterized by ➤
 - Reducible or gives history of reducibility
 - Gives expansile impulse on cough.
 - On the anatomical site of hernia defect



TYPES

1- Inguinal hernia

- **above** inguinal ligament (**above** groin crease)

2- Femoral hernia

- **below** inguinal ligament (**below** groin crease)

N.B.: [1] & [2] called **groin hernia**

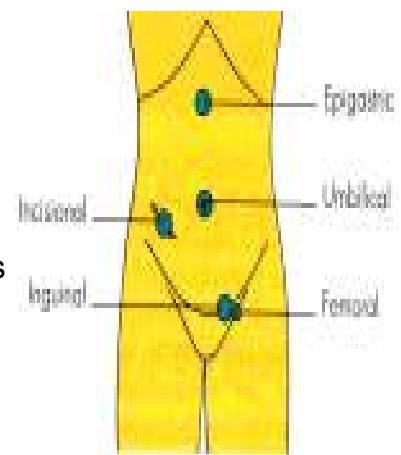
3- Umbilical hernia

- **midway** between xiphisternum & symphysis pubis

4- Epigastric hernia

- **away** from umbilicus at site of linea alba.

N.B : [3] & [4] called **abdominal hernia.**

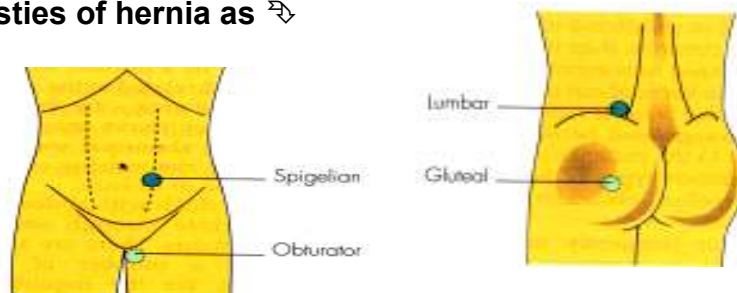


5- Incisional hernia

- **paralytic type** : due to injury of the nerve supplying the overlying muscles
- **defective type** : due to defect in the repair of abdominal incision.
e.g. infection, using absorbable sutures.

6- Others

- **Rare sties of hernia as** ➤



OBTURATOR HERNIA through obturator foramen.

LUMBER HERNIA through lumbar region.

GLUTEAL HERNIA through greater sciatic foramen.

SCIATIC HERNIA through lesser sciatic foramen.

SPIGELIAN HERNIA through spigelian fascia

AETIOLOGY

A- Congenital

due to presence of a **congenital performed sac**.

- ① Unobliterated processus vaginalis (**congenital O.I.H**).
- ② Unobliterated physiological umbilical hernia of the fetus (**exomphalos**)

B- Acquired due to ➡

1- ↑ INTRA ABDOMINAL PRESSURE

- **Chronic straining** due to chronic cough, constipation ...etc.
- **Abdominal swelling** due to pregnancy, ascites or organomegaly.
- **Occupational** as porters.

2- WEAKNESS OF ABDOMINAL WALL

- **Obesity** because fats separate the muscle bundles
- **pregnancy** due to stretching of the abdominal wall.
- **Abdominal operations** i.e. abdominal scars.

COMPONENTS

A- Sac

- This is the peritoneal pouch which bulges out through The abdominal wall defect. It has a neck, body & fundus

B- Contents

- It may be any abdominal viscus **except the pancreas**. (being retroperitoneal) the most common are ➡



	ENTEROCELE	OMENTOCLE
<ul style="list-style-type: none"> • Consistency • Reducibility • Percussion • Palpation 	<ul style="list-style-type: none"> • Soft • 1st part difficult, because of gases & show gurgling • Resonant • Lobulated surface 	<ul style="list-style-type: none"> • Doughy • Last part difficult, because of adhesion of sac & omentum. & not show gurgling • Dull. • Smooth surface

Special contents

- 1. RICHTER'S HERNIA** - a portion of circumference of intestine. ➡
 - it occurs with femoral hernia.
 - diagnosed only if strangulated.

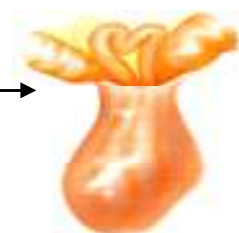


- 3. LITTRE'S HERNIA**

The content is **Mickle's diverticulum**.

- 2. MAYDL'S HERNIA**

It contains 2 loops of the bowel (**hernia in W**) ➡ while the intermediate loop lies in peritoneal cavity.



C- Coverings

- Structures stretched over the sac.

COMPLICATIONS OF HERNIA

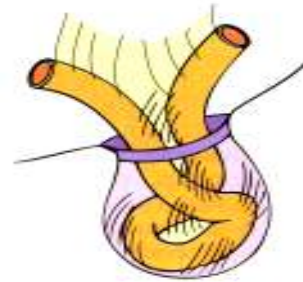
1. Irreducibility

DEFINITION

Failure to return the contents into the Abdomen.

AETIOLOGY

- Adhesions between the contents & the sac.
- Adhesions between the contents themselves.
- Protrusion of new content during strain.



D.D

	Irreducible Hernia	Obstructed Hernia	Strangulated Hernia
• Acute obstruction	-	+	+
• Impulse on cough	+	+	-
• Tense & tender	-	-	+

TREATMENT

Irreducibility increases the risk of obstruction & strangulation.
this means early operation (must be according to type of hernia)
then cut of adhesions & reduction of hernia.

2. Obstruction

DEFINITION

Occlusion of intestinal lumen from outside (adhesions) or inside (fecal material) but the blood supply is still **unaffected**

AETIOLOGY

Usually 2ry to irreducibility.

CLINICAL PICTURE

Symptoms of acute intestinal obstruction
(colics, vomiting, distention & absolute constipation)



DD

	Irreducible Hernia	Obstructed Hernia	Strangulated Hernia
• Acute obstruction	-	+	+
• Impulse on cough	+	+	-
• Tense & tender	-	-	+

TREATMENT

Early surgery as DD between it & strangulation is very difficult.

3. Strangulation

DEFINITION

The hernia becomes strangulated when the blood supply of its content is **seriously impaired**.

INCIDENCE

[A] It varies according to the type of hernia

- Inguinal 2 – 4 %
- Femoral 25 – 30 %
- Para-umbilical 15 – 20 %
- Incisional 3 – 5 %

[B] Although the incidence is higher in femoral hernia yet strangulated inguinal hernia account for more than 50 % (as it is more common)

[C] **Strangulation** occur at any age & commoner after prolonged use of **truss**

PREDISPOSING FACTORS

1. Irreducibility & obstruction.
2. Sudden expulsion of new contents following straining.
3. Repeated attempts at reduction producing oedema

PATHOLOGY

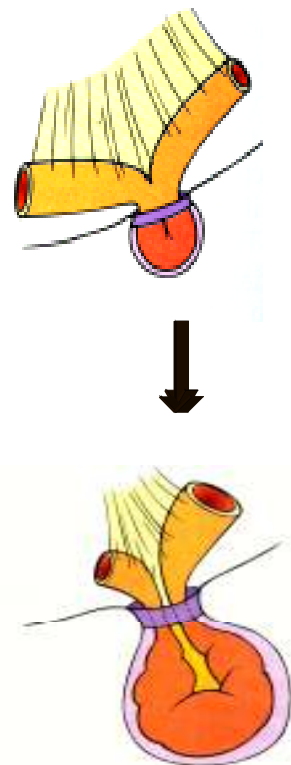
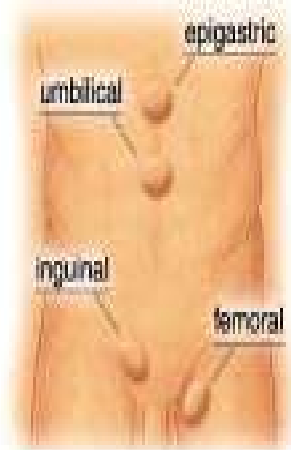
A- The constricting agents

- **Any resistant structures** outside the sac like ➤
 - Superficial or deep ring with **inguinal** hernia
 - Sharp edge of lacunar ligament with **femoral** hernia
 - Defect in linea alba with **para-umbilical** hernia
- **Narrow neck** of the hernia sac.
- **Bands of adhesions** within the sac.

B- The contents

- Constricting agents will compress the veins in the intestinal mesentery (thin walled) 1st → ↑ Venous pressure → oedema & congestion of intestinal loops. if the congestion is marked increased → hemorrhage in intestinal wall & lumen
- **Further** rise of pressure → impairment of arterial blood supply so the contents lose their vitality & may be undergo gangrene.
- **Finally**, gangrene occurs, it starts at ring of constriction then affects the anti-mesenteric border of intestine. if perforated → peritonitis.

N.B.: Neglected cases will die from septic shock & dehydration



CLINICAL PICTURE

(A) General Examination

- Manifestations of acute intestinal obstruction
(colics, vomiting, distention & absolute constipation)
- Hypovolaemic shock & signs of dehydration
- If gangrene occurs → peritonitis → paralytic ileus i.e. no colics
which is " bad sign " → finally septicemia → septic shock.

N.B.: Manifestations of (A.I.O) are **absent**
with 1. Strangulated **omentum**.

2. Strangulated **Richter's** hernia.

3. Strangulated **Littre's** hernia.



(B) Local Examination

" **Cardinal signs** of strangulation "

1. Tense & tender
2. Irreducible
3. **No** impulse on cough.

DD

	Irreducible Hernia	Obstructed Hernia	Strangulated Hernia
• Acute obstruction	-	+	+
• Impulse on cough	+	+	-
• Tense & tender	-	-	+

TREATMENT

[**Urgent surgery after resuscitation**]

A- Immediate resuscitation

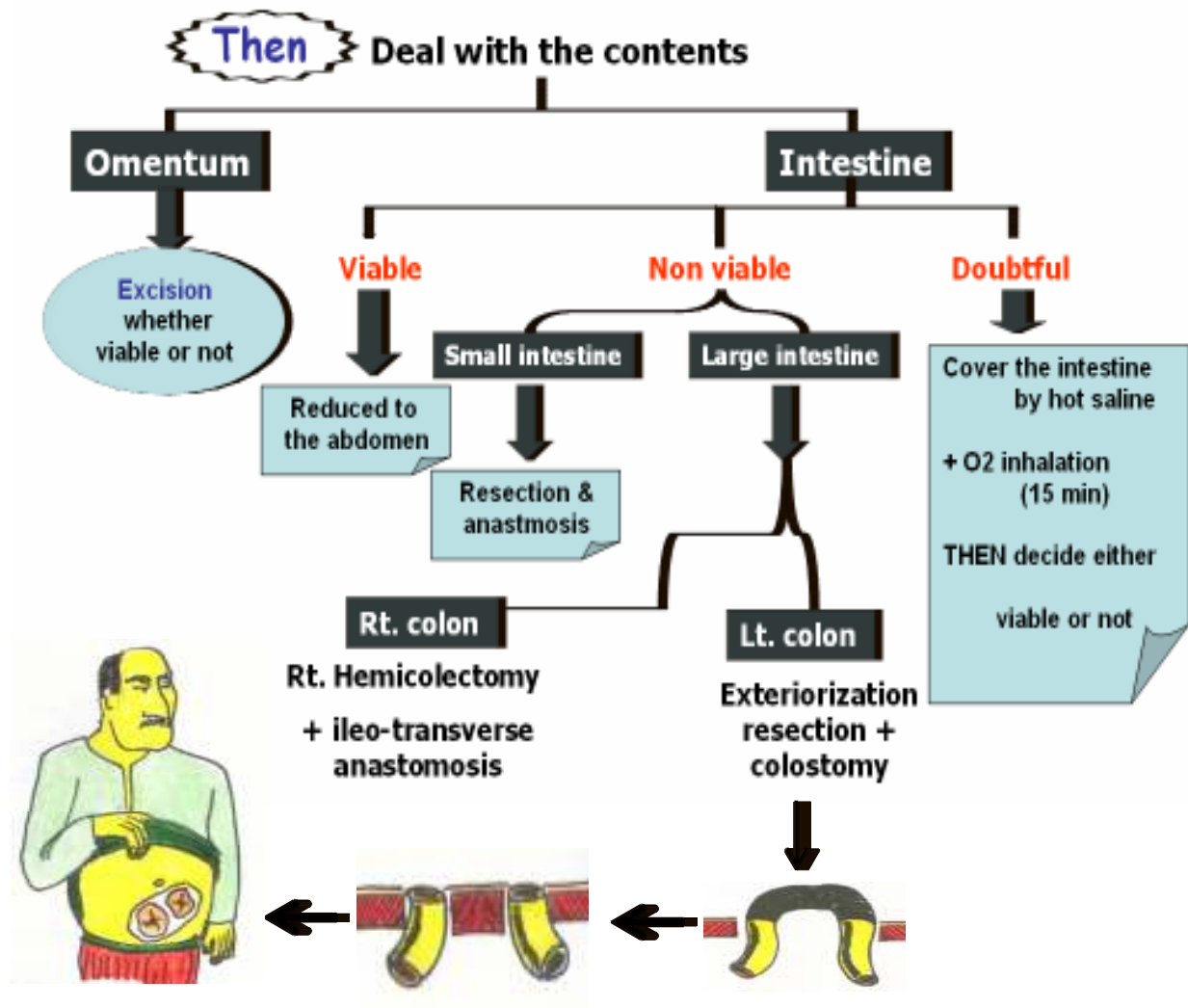
- **Ryle's tube** for suction + no oral intake.
- **I.V fluids** to correct electrolyte imbalance
- **I.V blood & Ringer's lactate** to correct hypovolaemia.
- **I.V broad spectrum A.B.** to guard against peritonitis.

B- Immediate operation

- **Incision** should be planned to expose the fundus of sac & open it to evacuate toxic fluid 1st.
- **The constricting agents** should be divided over a grooved director or the left finger to avoid injury of intestine.
- **The contents** are pulled out & examined, viable or not



	Viable intestine	Non-viable intestine
<ul style="list-style-type: none"> • Intestinal color • Peritoneal luster • Mesenteric arteries 	<ul style="list-style-type: none"> • Pink or dark red • Present. • Pulsating 	<ul style="list-style-type: none"> • Grey or black. • Absent. • Non pulsating
<ul style="list-style-type: none"> • By pinching • Consistency • If injured 	<ul style="list-style-type: none"> • Contracts • Firm • Bleeding occur 	<ul style="list-style-type: none"> • No response • Floppy • No bleeding



- **Repair the hernia defect** by prolene sutures (non absorbable)
- **Subcutaneous drain** is usually used.
- **Post-operative care**
 - a. Continue Ryle's suction with I.V fluid (2 – 3 days)
 - b. Prophylactic A.B.
 - c. Removal of drain after 5 days.

4. Inflammation

DEFINITION

It means inflammation of the contents.

AETIOLOGY

1. Rough manipulations.
2. Ill fitting truss → repeated rough friction.
3. Inflamed contents (appendix or meckle's diverticulum)

CLINICAL PICTURE

The hernia is tender but not tense and overlying skin is red & oedematous.

TREATMENT

Operation is essential as strangulation cannot be excluded.

5. Hydrocele of the hernia sac

AETIOLOGY

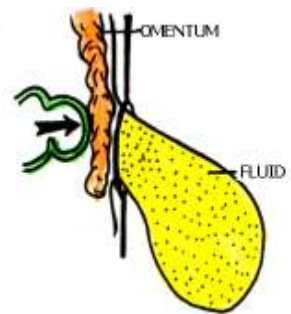
When narrow necked sacs becomes occluded by omentum or adhesions after reduction of its contents → collection of serous fluid in the sac.

CLINICAL PICTURE

Cystic translucent inguino-scrotal swelling.

TREATMENT

Excision



6. Torsion of the omentum

7. Rupture of the hernia sac

SLIDING HERNIA

DEFINITION

This is a hernia where a viscus form a part of the wall of the sac & not part of the contents.

INCIDENCE

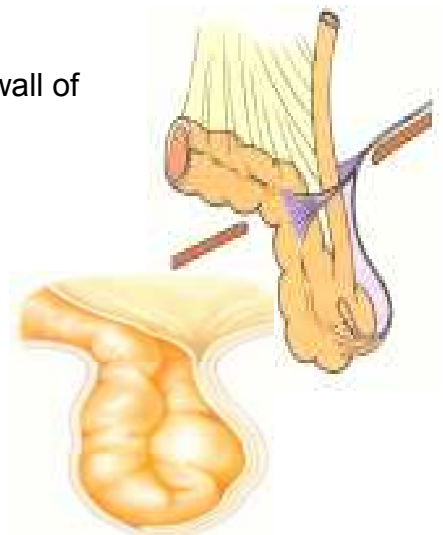
1. Common with long standing hernia & old males
2. The commonest sliding organs are → urinary bladder, caecum & sigmoid colon.

CLINICAL PICTURE

- **Old** male with **incomplete** reducible complete inguino-scrotal hernia.
- **Urinary symptoms** (double micturation) if sliding urinary bladder.

TREATMENT

- Do not try to dissect the sliding viscus from the sac as this may lead to devascularisation or injury of the viscus.
- Free the sliding sac & viscus well from the surrounding structures & push them back then good repair is done as hernioplasty.



SURGICAL ANATOMY OF THE INGUINAL REGION

Layers of abdominal wall

Skin

Superficial fascia

- **Superficial fatty layer (Camper's fascia)**
- **Deep membranous layer (Scarpa's fascia)**

3 Muscles

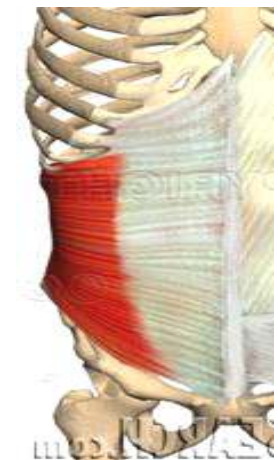
1. External oblique muscle

- **Origin** : from outer surface of lower 8 ribs.
- **Insertion** : Xiphoid process, linea alba, A.S.I.S, outer lip of iliac crest & pubic tubercle.
- **Surgical importance** :
 - Fibers run downwards, forwards & medially
 - The lower part becomes aponeurotic & its free border enfolded as inguinal ligament
 - **External (superficial) inguinal ring** is an opening of external oblique aponeurosis.



2. Internal oblique muscle

- **Origin** : from lateral 1/2 of upper surface of inguinal ligament.
- **Insertion** : lower 6 costal cartilage, xiphoid process & linea alba.
- **Surgical Importance** :
 - Fibers run upwards, forwards & medially
 - The lower fibers inserted as **conjoined tendon** with transversus abdominis muscle into the pubic crest & pectineal line.



3. Transversus abdominis muscle

- **Origin** : from lateral 1/3 of upper surface of inguinal ligament & lower 6 costal cartilage.
- **Insertion** : Xiphoid process & linea alba.
- **Surgical Importance**:
 - It is inserted as **conjoined tendon** with internal oblique muscle.



Fascia transversalis

- Thin but strong fascial layer lies in front of the peritoneum
- **Internal (deep) inguinal ring** is an opening of fascia transversalis

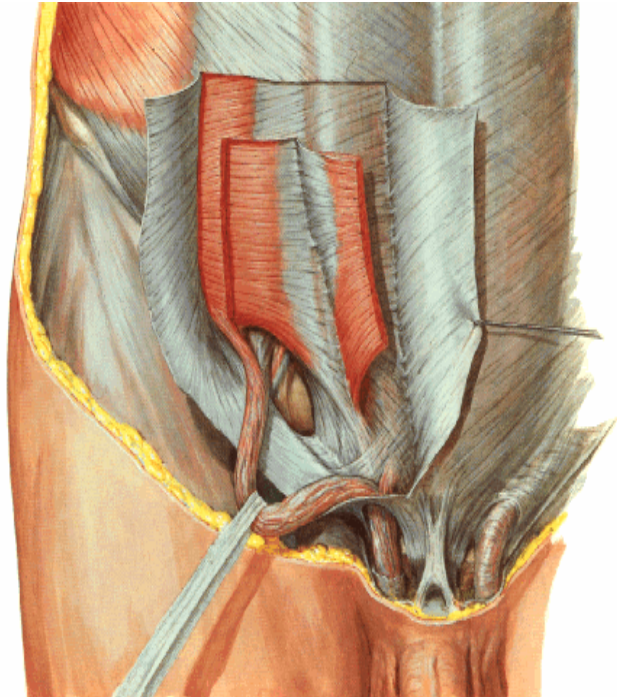
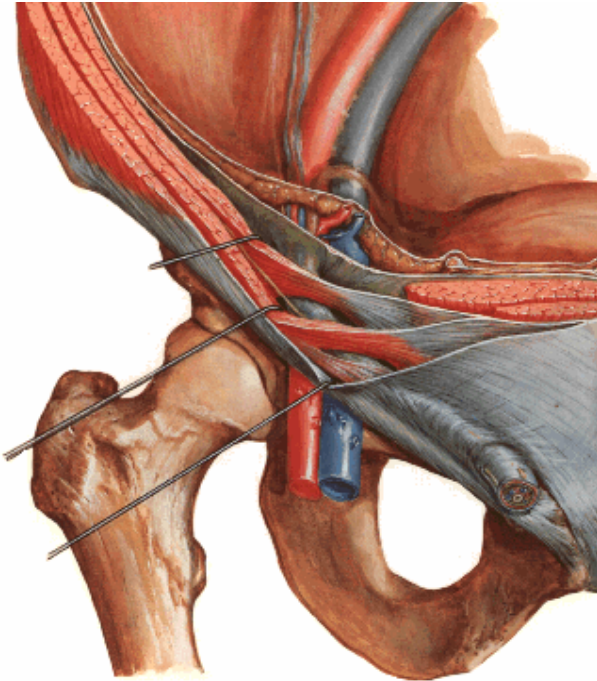
INGUINAL CANAL

DEFINITION

- It is an oblique passage in the lower part of the anterior abdominal wall, through which the testis passes in order to leave the abdomen & reach the scrotum

LENGTH & SITE

- Its length about **1.5 inches (4 cm)** and passes downward, forward & medially from deep to superficial ring, it lies parallel to the medial half of the inguinal ligament



BOUNDARIES

Beginning

- **Deep inguinal ring :**
 - An opening of fascia transversalis
 - 1/2 inch above the **mid inguinal point**
(point midway between A.S.I.S & symphysis pubis)
 - It is an **inlet** for spermatic cord.
 - The inferior epigastric vessels run **medial** to it.

N.B.: Mid-point of inguinal ligament
(point midway between A.S.I.S & the pubic tubercle)

End

- **Superficial inguinal ring :**
 - A triangular opening of external oblique aponeurosis
 - 1/2 inch above & medial to pubic tubercle.
 - It is an **exit** for spermatic cord & ilio-inguinal nerve.

Anterior wall

- External oblique aponeurosis.
- Lower parts of internal oblique muscle **laterally**.

Posterior wall

- Fascia transversalis.
- Conjoined tendon **medially**.

Floor

- **Upper grooved surface** of inguinal ligament

Roof

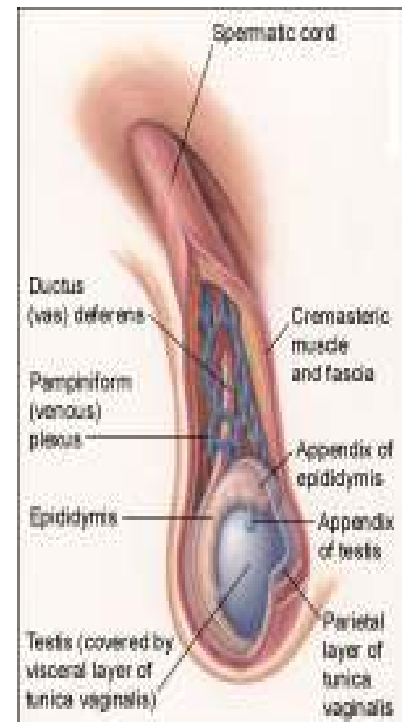
- **High arched** fibers of conjoined tendon

CONTENTS

- **Ilio-inguinal nerve**
which pierces the posterior wall of the canal then passes through superficial inguinal ring.
- **Spermatic cord** if male
or **round ligament** if female

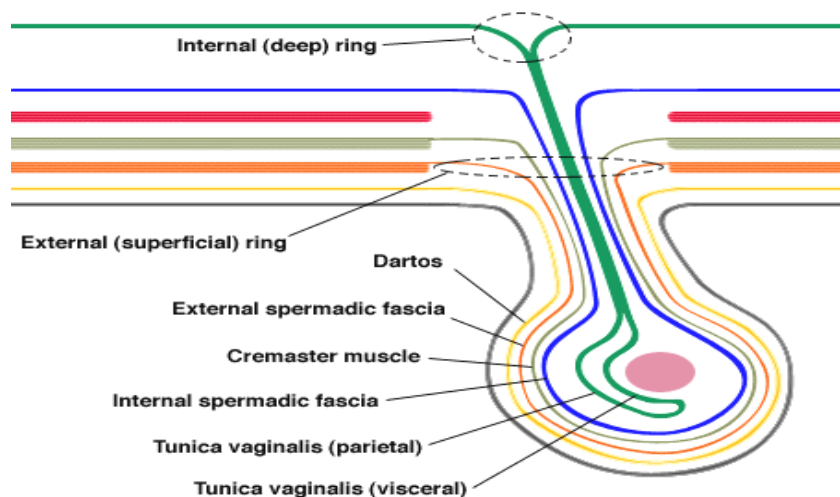
Contents of the spermatic cord

- **Vas** deferens.
- **Artery** of vas & testicular artery.
- **Vein** of vas & pampiniform plexus.
- Autonomic **nerves**.
- Testicular **lymphatic**
- **Vestige** of processus vaginalis.
- Genital branch of genito-femoral nerve.



Coverings of the spermatic cord

- **External spermatic fascia** from external oblique aponeurosis.
- **Cremasteric muscle** from internal oblique muscle.
- **Internal spermatic fascia** from fascia transversalis.



FACTORS PREVENT INGUINAL HERNIA

1. Inguinal canal is oblique

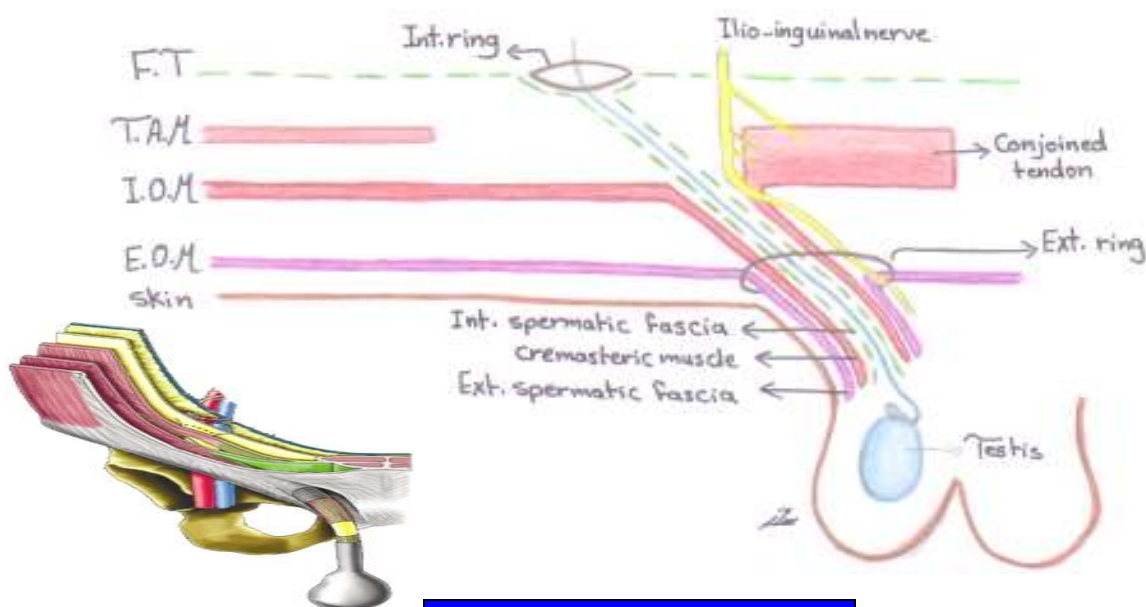
So the internal ring & external ring not at same plane.

2. During ↑ intra-abdominal pressure The followings occur ➔

- Contraction of **anterior abdominal wall** so that the anterior & posterior wall of inguinal canal are approximated.
- Contraction of **external oblique muscle** leads to narrowing of superficial ring.
- Contraction of **cremasteric muscle** leads to elevation of scrotum so closure of superficial ring occur.

3. Shutter mechanism

- Due to **triple** relation of the lower fibers of **internal oblique muscle** to the inguinal canal. In the (anterior, roof & posterior wall)
- So that contraction of this muscle during strain leads to closure of inguinal canal around the spermatic cord.



HASSELBACH TRIANGLE

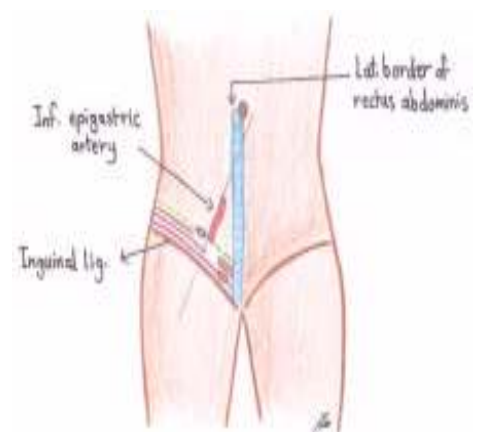
- Direct inguinal hernia protrude through this triangle

Site of Hasselbach triangle

medial part of posterior wall of inguinal canal

The Boundaries

- **Medially** : lateral border of rectus sheath.
- **Laterally** : inferior epigastric vessels.
- **Inferiorly** : inguinal ligament.



I- INGUINAL HERNIA

AETIOLOGY

INCIDENCE





PATHOLOGY

a. Defect

b. Sac

c. Content

d. Coverings

Indirect (Oblique) Inguinal Hernia	Direct Inguinal Hernia
	
<ul style="list-style-type: none"> • Congenital peritoneal sac • Acquired causes 	<ul style="list-style-type: none"> • Paralysis of ilio-inguinal nerve during appendectomy • Acquired causes
80 %	20 %
<ul style="list-style-type: none"> • Deep ring <u>lateral</u> to inferior epigastric artery • It presents inside the cord 	<ul style="list-style-type: none"> • Hasselbach Δ <u>medial</u> to inferior epigastric artery • It presents behind the cord.
Small intestine, omentum or both	
	
IN INGUINAL REGION	INGUINAL REGION
<ol style="list-style-type: none"> 1. Skin. 2. Superficial fascia 3. Ext. oblique apponeurosis 4. Cremasteric muscle. 5. Int. spermatic fascia. 6. Extra-peritoneal fat 	<ol style="list-style-type: none"> 1. Skin. 2. Superficial fascia 3. Ext. oblique apponeurosis. 4. Conjoined Tendon. 5. Fascia transversalis. 6. Extra-peritoneal fat
IN THE SCROTUM	
<ol style="list-style-type: none"> 1. Skin 2. Superficial fascia with dartos muscle. 3. Ext. spermatic fascia 4. Cremasteric muscles. 5. Int. spermatic fascia. 6. Extra-peritoneal fat 	

CLINICAL PICTURE	Indirect (Oblique) Inguinal Hernia	Direct Inguinal Hernia
<ul style="list-style-type: none"> • Age • Side • Shape. • Descent • Descent to scrotum • Reduction. • Internal ring test • External ring test • Complications 	<ul style="list-style-type: none"> • Any age. • Less common bilateral • Pyriform (oblong) • Downwards, forwards & medially • Can descend. • Upward, backwards & laterally. • Hernia does not protrude • impulse at tip of little finger. • More common 	<ul style="list-style-type: none"> • Usually old age • More common bilateral • Hemispherical (rounded) • Forwards • Extremely rare. • Backwards • Hernia protrudes • impulse at medial side of little finger. • Less common.

SPECIAL TYPES

Indirect (oblique) inguinal hernia

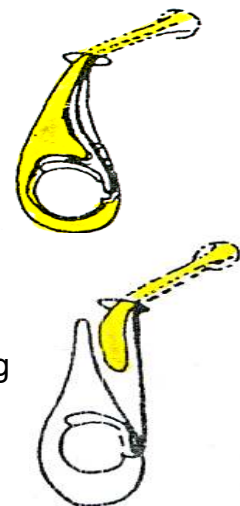
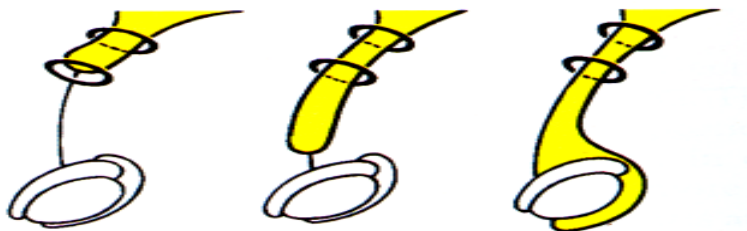
1. Congenital hernia

- due to persistence patency of processus vaginalis.
- it reaches down the scrotum from the start and the Testes lies among the content
- although congenital, it may appeared with adult life.

2. Infantile hernia (operative finding only)

- the tunica vaginalis extends upwards to the external ring & another true hernia sac passes behind it i.e. 2 sacs.

3. Adult type which may be ➤



BUBONOCELE TYPE

Hernia is limited to the inguinal canal & seen as bulge or mass at inguinal region

FUNICULAR TYPE

Hernia passes with cord & stops just above the epididymis

COMPLETE SCROTAL HERNIA

Hernia descends to the bottom of scrotum.

SPECIAL TYPES

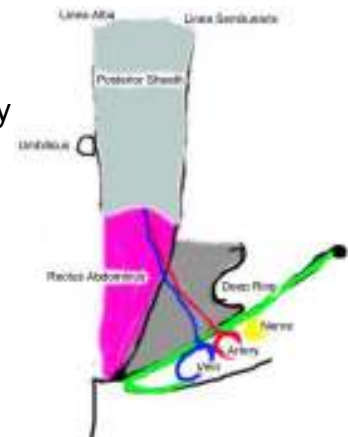
Direct inguinal hernia

1. Lateral type

- Hernia bulges through the **lateral** part of Hasselbach's Δ (made by fascia transversalis only) & thus it has a very **wide** neck & it is **less** liable to complicate.
- Hernia **never** descends to the scrotum

2. Medial type

- Hernia bulges through the **medial** part of Hasselbach's (defect in conjoint tendon in front of fascia transversalis) & thus it has a very **narrow** neck & it is **more** liable to complicate.
- Hernia **may** descends to the scrotum; but never reach the bottom.



DD OF INGUINAL & INGUINO-SCROTAL SWELLINGS

Inguinal swellings

1. **Hernia** : Oblique inguinal hernia (bubonocoe or funicular types) & direct inguinal hernia.
2. **Hydrocele** : Hydrocele of hernia sac.
3. **Testis** : Undescended, ectopic or retractile testicle.
4. **Cord** : Lipoma of the cord.

Inguino-scrotal swellings

1. **Hernia** : Oblique inguinal hernia (complete type)
2. **Hydrocele** : Hydrocele of hernia sac, congenital & infantile types
3. **Testis** : Retractable testicle.
4. **Cord** : Varicocele

MANAGEMENT OF INGUINAL HERNIA

Investigations

- 1- To detect underlying cause of \uparrow I.A.P
As chest X-ray, abdominal U/S & trans-rectal U/S for S.E.P
- 2- To assess surgical fitness of the patient
As E.C.G, blood picture, blood sugar & kidney function tests

Treatment

1. TRUSS

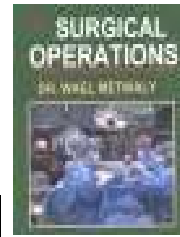
- **Indication** :
If patient unfit for surgery.
- **Complications** :
 1. Infection.
 2. Adhesions \rightarrow strangulation.
 3. Pressure atrophy of local muscle.



2. OPERATIONS See next page

CHOICE OF OPERATION

For more details
see
Operative notes



Indirect (oblique) inguinal hernia

Herniotomy

- Removal of hernia sac after reduction of the contents

INDICATED WITH ➤

- ① infants
- ② children < 12 years
- ③ **small** hernial defect in adult with good musculature

Herniorrhaphy

- **Herniotomy** + narrowing the defect & repair of post. wall of inguinal canal through one of the following methods ➤

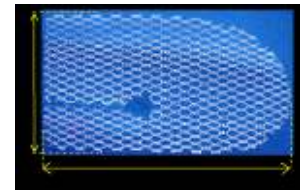
- 1- **Bassini** repair.
- 2- **Shouldice** repair.
- 3- **Mc vay** repair.

INDICATED WITH ➤

large hernial defect in adult with good musculature

Hernioplasty

- **Herniotomy** + repair the defect by synthetic material i.e **prolene mesh**



INDICATED WITH ➤

- ① old patient with weak musculature
- ② very wide defect
- ③ recurrent hernias

Direct inguinal hernia

Management of direct hernias, differs from indirect hernias in

- ① The sac is medial to inferior epigastric vessels.
- ② The sac lies behind the cord & not within its covering.
- ③ The sac & defect are wide, so the sac is not excised & just invaginated by repair i.e. **herniorrhaphy** or **hernioplasty**.

RECURRENT INGUINAL HERNIA

AETIOLOGY

1. Leaving part of the original sac.
2. Missing a second sac at operation e.g. **pantaloon hernia**.
3. Use of absorbable sutures in hernia repair
4. Postoperative hematoma or infection → weakness of the repair
5. Rapid return to hard work

TREATMENT

Correction of predisposing factors + **hernioplasty**

SURGICAL ANATOMY

FEMORAL SHEATH

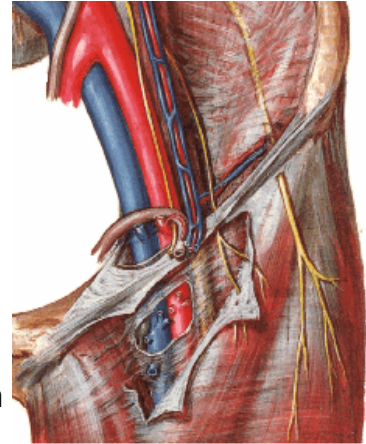
Anterior femoral sheath

Formed of **fascia transversalis**

Posterior femoral sheath

Formed of **fascia iliacus**

- The **femoral sheath** is divided by 2 thin fibrous septum Into 3 compartments.
- The most medial compartment of femoral sheath is called **femoral canal**.
- The Intermediate compartment contains the femoral **vein** & the lateral compartment contains the femoral **artery**

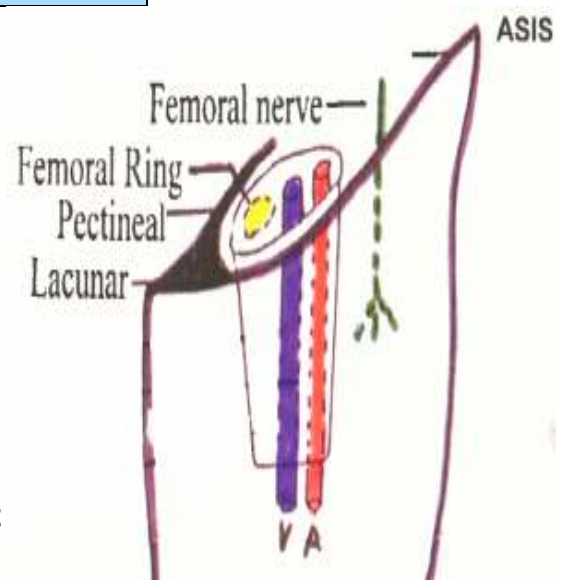


N.B.: The femoral nerve lies outside the sheath

FEMORAL CANAL

Structure

- The most medial compartment of femoral sheath
- Cone shaped (1/2 inch long)
- Its **mouth (femoral ring)**
- Its **apex** is formed of fusion of medial border of femoral sheath & septum between the femoral canal and the femoral vein.



Contents

- Fat, lymphatics & lymph node of **Cloquet**

Function

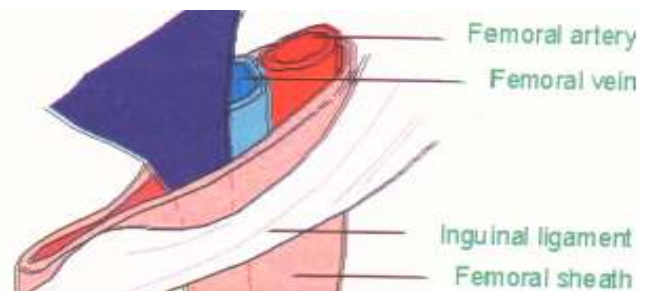
- Give space for expansion of femoral vein during ↑ venous return with lower limb exercise

FEMORAL RING

Mouth of the femoral canal

Boundaries

- **Anterior** : Inguinal ligament (**Poupart's ligament**)
- **Posterior** : **Cooper's ligament** (**Pectineal ligament**)
- **Medially** : (**Lacunar ligament**)
- **Laterally** : Femoral vein



II- FEMORAL HERNIA

DEFINITION

- Hernia which leaves the abdomen through the femoral ring into the femoral canal

AETIOLOGY

- Always acquired **never** congenital

PATHOLOGY

a. Defect : Femoral ring

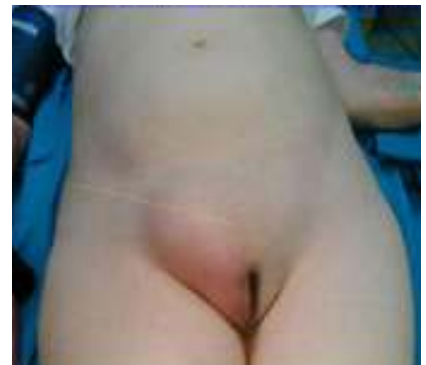
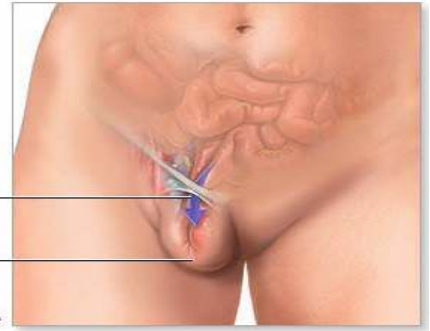
b. Sac : passes **downwards** in the femoral canal then **forwards** stretching the cribriform fascia of the saphenous opening then **upwards & laterally** towards A.S.I.S.

so femoral hernia is liable to be strangulated

c. Contents : Omentum, bowel or both.

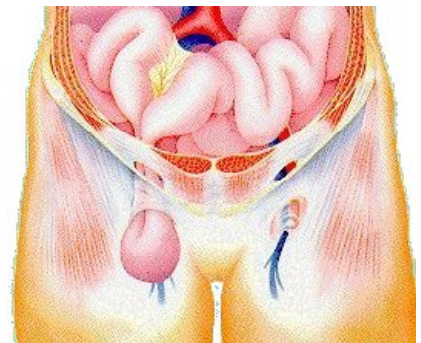
d. Coverings : 1. Skin.
2. Superficial fascia
3. Stretched **cribriform fascia**
4. Anterior femoral sheath

Femoral hernia
Herniated intestine causing visible bulge



CLINICAL PICTURE

- **Hernia** is common in **females** due to ↗
 - (1) The female pelvis being larger
→ ↑ abdominal pressure
 - (2) Small sized femoral vein
→ wide femoral ring
- **Hernia** is characterized by ↗
 - Present below the medial part of inguinal ligament.
 - Present below & lateral to the pubic tubercle.
 - Gives an expansile impulse on cough.
 - It can be reduced downwards, backwards & finally upwards,

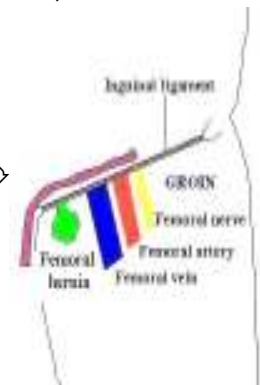


DIFFERENTIAL DIAGNOSIS

Reducible femoral hernia

REDUCIBLE INGUINAL HERNIA which characterized by ↗
Above & medial to pubic tubercle

FEMORAL ANEURYSM which characterized by ↗
Expansile pulsation & moves along but not across the course of artery.



PSOAS ABSCESS which characterized by ↗
Cross fluctuation

SAPHENA VARIX which characterized by ↗
Thrill on cough, completely disappear on lying down, venous hum on auscultation & apparent varicose vein.

Irreducible femoral hernia

IRREDUCIBLE INGUINAL HERNIA

LIPOMA which characterized by ↗
Soft, lobulated surface, slippery edge, superficial to muscles, skin over show dimpling, painless & pseudo-fluctuant swelling

INGUINAL L.Ns

ILIOPSOAS BURSA which characterized by ↗
Associated osteoarthritis of hip joint

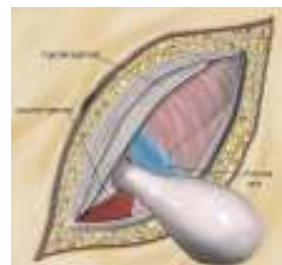
TREATMENT

Surgery is the only line of treatment

(3 Approaches)

1- Low approach

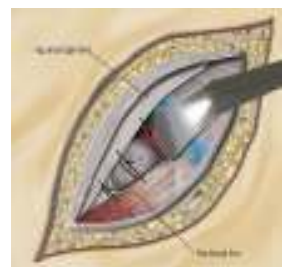
- This approach is **rarely done nowadays**, because of low transfixation of the sac which is therefore not completely excised.
- The incision $1\frac{1}{2}$ inch below & parallel to the inguinal ligament.
- **The repair** : by suturing the inguinal ligament (anterior border of femoral ring) to cooper's ligament (posterior border of femoral ring)
i.e. **Poupart's** to **Pectineal**



2- High approach

(**Lotheissen's operation**)

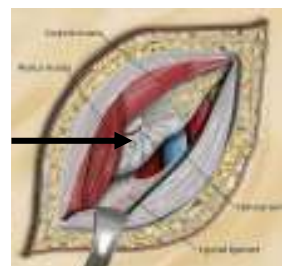
- The incision above & parallel to the medial $\frac{2}{3}$ of the inguinal ligament
- The inguinal canal is opened & fascia transversalis is incised, the sac is opened & the content are reduced then the sac is transfixed & excised.
- **The repair** : as above



3- Preperitoneal approach

(**Mc Evedy's operation**)

- The incision is para-rectal at lateral border of lower part of rectus abdominis.
- The incision is deepened dividing fascia transversalis Till the peritoneum then the sac is transfixed & excised.
- **The repair** : as above



III- UMBILICAL HERNIA

1. Congenital

2. Infantile

3. Adult

1. Congenital umbilical hernia

Exomphalos

PATHOLOGY

a. Defect

b. Sac

c. Contents

d. Coverings

COMPLICATIONS

TREATMENT

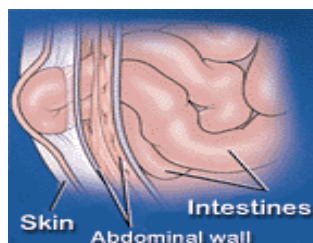
Exomphalos minor



- Small (< 5 cm) at the umbilicus
- Peritoneum.
- Bowel.
- Wharton's Jelly + layer of amniotic membrane.

- During ligation of an umbilical stump, a loop of intestine may be entangled in the ligature

- Content are reduced & returned to the abdomen then the sac is excised & the defect is repaired in layers



Exomphalos major



- Large (> 5 cm) at the center of abdomen.
- Peritoneum
- Bowel ± liver
- Layer of amniotic membrane

- Rupture may occur with infection → peritonitis
(The cause of death)

Urgent operation

The problem : No space in abdomen to accommodate the contents so the skin on either sides of the defect is undercut then flaps will be sutured together over the sac + release incision over the flanks.

Later on : If infant survive, definitive repair is done.

2. Infantile umbilical hernia

AETIOLOGY

- Weakness of the umbilical scar from infection
- ↑ I.A.P from cough.

PATHOLOGY

- a. **Defect** : Umbilical scar
- b. **Sac** : Small, conical with **wide** neck
- c. **Contents** : Omentum, bowel or both.
- d. **Coverings** : 1. **Umbilical scar**.
2. Extra- peritoneal fat

CLINICAL PICTURE

- Patient shows umbilical protrusion on cough .
- Edges can be palpated as firm ring

COMPLICATIONS

 Rare

TREATMENT

Strapping better avoided as most of cases closed spontaneously within 2 years

Anatomical repair with prolene sutures if the defect more than 2 fingers or the hernia persist more than 2 years



3. Adult umbilical hernia

Para-umbilical hernia

AETIOLOGY

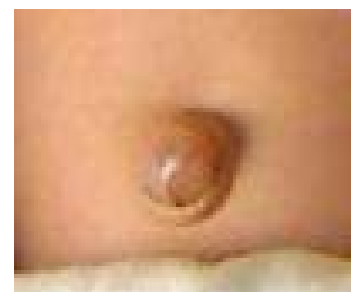
- Middle aged female.
- Usually obese, multipara .
- Para- umbilical & **never** umbilical.

PATHOLOGY

- a. **Defect** : Linea alba.
- b. **Sac** : Small, crescentic with **narrow** neck
- c. **Contents** : Omentum, bowel or both.
- d. **Coverings** : 1. Skin.
2. Superficial fascia
3. Stretched **linea alba**.

CLINICAL PICTURE

- Patient shows para-umbilical protrusion on cough.
- **DD** between **supra-** umbilical & **infra-** umbilical hernias by the (crescentic shape)



N.B.: Adult umbilical hernia (acquired)

usually seen as **everted umbilicus** with patient with ascites or ↑ I.A.P

COMPLICATIONS Common

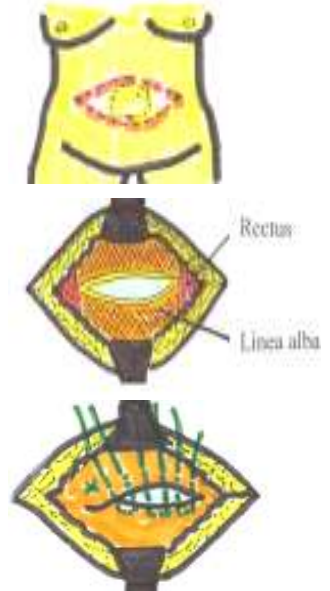
TREATMENT

Mayo's repair

- Elliptical transverse incision is made over the hernia
- Sac is exposed & dissected down to the neck.
- Sac is opened at its neck because of adhesions at fundus.
- Contents are dealt with & the sac is transfixed & excised.
- **Repair** : the defect is closed by overlap of the upper flap over the lower flap of anterior rectus sheath.

Hernioplasty

using prolene mesh .



IV. EPIGASTRIC HERNIA

AETIOLOGY

Usually acquired, It is formed as a direct result of sudden strain → tearing of the interlacing fibers of linea alba.

PATHOLOGY

a. **Defect** : Linea alba.

b. **Sac** : may be 2 types ➔

1. FATTY HERNIA OF LINEA ALBA

It is a protrusion of extra-peritoneal fat only without a peritoneal sac

2. TRUE EPIGASTRIC HERNIA

It drags a pouch of peritoneum as a hernia sac

c. **Contents** : The sac is empty (because of narrow neck) or it contains a small portion of greater omentum

d. **Coverings** : 1. Skin.
2. S.C tissue



CLINICAL PICTURE

- Patient shows a small irreducible protrusion simulating to lipoma .
- Severe epigastric pain with nausea & vomiting from friction of herniated omentum on the stomach (DD peptic ulcer or gall bladder disease)

TREATMENT

If the defect is small

Excision of the protruding extra peritoneal fat & the hernia sac followed by simple closure of the linea alba defect

If the defect is large

It is repaired by **Mayo's repair**.

V. INCISIONAL HERNIA

DEFINITION

Hernia developing after abdominal incision.

AETIOLOGY

Pre- operative causes

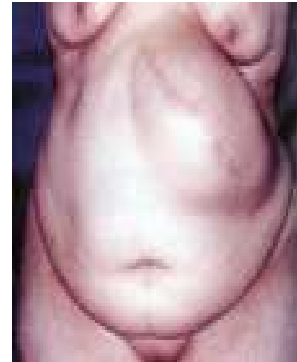
- Obesity .
- Diabetes mellitus, cirrhosis, steroid therapy
- Anemia & hypoproteinemia
- Respiratory problems as chronic bronchitis

Operative causes

- Uses of **absorbable** sutures .
- **Rough** surgical technique .
- **Tight** stitches→ devitalized wound
- Insertion of a **drain** through the wound

Post- operative causes

- Persistent pre-operative causes
- Wound hematoma or infection.
- Rapid return to hard work



CLINICAL PICTURE

- Patient shows a bulge involve the surgical scar gives an expansile impulse on cough & ↑ steadily by time.

TREATMENT

Anatomical repair

Repair the defect in layers according to site of incision.

Hernioplasty

using prolene mesh

VI. RARE HERNIAS

1. Obturator hernia

- The sac passes through the **obturator foramen** inside the pelvis so **no** external swelling so unlooked until strangulation occurs.

TREATMENT (Trans-abdominal approach)

contents are reduced, sac is excised & obturator canal obliterated by sutures.

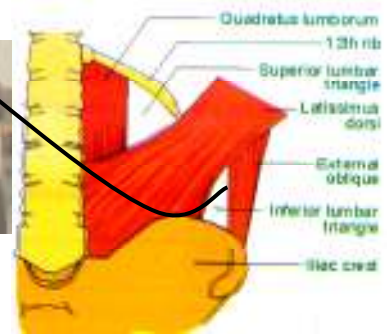


2. Lumbar hernia

Petit's lumbar triangle

Boundaries of inferior lumbar triangle

- **Below** : Iliac crest.
- **Laterally** : Latissimus dorsi.
- **Medially** : Ext. oblique muscle.



TREATMENT

The hernia can be controlled by a **belt**, but if large **hernioplasty** is required.

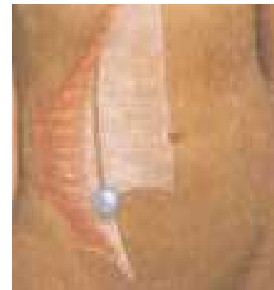
3. Gluteal & Sciatic hernia

- **Gluteal hernia** → protrude through **greater** sciatic notch
- **Sciatic hernia** → protrude through **lesser** sciatic notch.



4. Spigelian hernia

- The sac of hernia passes through a defect in the **spigelian fascia**, the sac lies between the transversus abdominis muscle and internal oblique muscle or lie beneath the external oblique muscle
- The strangulation is very common.



TREATMENT

Excision of the sac & closure of the defect i.e. **herniorrhaphy**.

5. Perineal hernia

- It is hernia through a defect in the **levator ani** muscle, passing through the ischio-rectal fossa, then para-rectal to present itself in the perineum

